

What is claimed is:

[C001] 1. A fuel cell assembly comprising a plurality of fuel cells, each of said fuel cells comprising

an anode layer, a cathode layer and an electrolyte interposed therebetween;

a conducting layer in intimate contact with at least one of said cathode layer and said anode layer;

wherein said conducting layer is configured to facilitate transport of electrons from said anode layer and said cathode layer.

[C002] 2. The fuel cell assembly according to claim 1, wherein said conducting layer is disposed on at least one of said anode layer and said cathode layer.

[C003] 3. The fuel cell assembly according to claim 1, wherein said conductive layer is substantially hollow.

[C004] 4. The fuel cell assembly according to claim 1 wherein at least some of said fuel cells further comprise an anode interconnect to support said anode layer and a cathode interconnect to support said cathode layer.

[C005] 5. The fuel cell assembly according to claim 4, wherein said conducting layer is disposed on at least one of said anode interconnect and said cathode interconnect.

[C006] 6. The fuel cell assembly according to claim 4, wherein at least one of said anode interconnect and said cathode interconnect is a hollow manifold comprising a top wall, said top wall comprising at least one opening extending therethrough in flow communication with said hollow manifold.

[C007] 7. The fuel cell assembly according to claim 6, wherein said hollow manifold is configured to provide a flowpath for at least one reactant selected from the group consisting of a fuel and an oxidant.

[C008] 8. The fuel cell assembly according to claim 7, wherein said hollow manifold further comprises at least one separator sheet to separate said flow path of said fuel and said oxidant.

[C009] 9. The fuel cell assembly according to claim 1, wherein said conducting layer has a shape selected from the group consisting of a mesh, a woven wire, a woven fiber, a felt and combinations thereof.

[C010] 10. The fuel cell assembly according to claim 1, wherein said conductive layer has a thickness of about 1 micron to about 250 micron.

[C011] 11. The fuel cell assembly according to claim 1, wherein said conductive layer has a thickness of about 1 micron to about 50 micron.

[C012] 12. The fuel cell assembly according to claim 1, wherein said conducting layer is chemically compatible with one of said anode layer and said cathode layer.

[C013] 13. The fuel cell assembly according to claim 1, wherein said conducting layer comprises a material selected from the group consisting of noble metals, metallic alloys, cermets, and oxides.

[C014] 14. The fuel cell assembly according to claim 1, wherein said conductive layer comprises a material selected from the group consisting of gold, silver, platinum, palladium, iridium, ruthenium, rhodium, indium-tin-oxide, ruthenium oxide, rhodium oxide, iridium oxide and indium oxide.

[C015] 15. The fuel cell assembly according to claim 1, wherein said fuel cell is selected from the group consisting of solid oxide fuel cells, direct methanol fuel cells, and protonic ceramic fuel cells.

[C016] 16. The fuel cell assembly according to claim 1, wherein said fuel cell comprises a solid oxide fuel cell.

[C017] 17. The fuel cell assembly according to claim 1 having one of a planar structure, a tubular structure and a combination thereof.

[C018] 18. A fuel cell assembly comprising: a plurality of fuel cells, each of said fuel cells comprising

an anode layer, a cathode layer and an electrolyte interposed therebetween;

an anode interconnect to support said anode layer and a cathode interconnect to support said cathode layer; and

a conducting layer disposed on at least one of said cathode layer and said anode layer to reduce interface resistance between said anode layer and said anode interconnect and between said cathode layer and said cathode interconnect;

wherein said conducting layer is configured to facilitate transport of electrons from said anode layer and said cathode layer.

[C019] 19. The fuel cell assembly according to claim 18, wherein said conductive layer is substantially hollow.

[C020] 20. The fuel cell assembly according to claim 18, wherein at least one of said anode interconnect and said cathode interconnect is a hollow manifold comprising a top wall, said top wall comprising at least one opening extending therethrough in flow communication with said hollow manifold.

[C021] 21. The fuel cell assembly according to claim 20, wherein said hollow manifold is configured to provide a flowpath for at least one reactant selected from the group consisting of a fuel and an oxidant.

[C022] 22. The fuel cell assembly according to claim 21, wherein said hollow manifold further comprises at least one separator sheet to separate said flow path of said fuel and said oxidant.

[C023] 23. The fuel cell assembly according to claim 18, wherein said conducting layer has a shape selected from the group consisting of a mesh, a woven wire, a woven fiber, a felt and combinations thereof.

[C024] 24. The fuel cell assembly according to claim 18, wherein said conducting layer is chemically compatible with one of said anode layer and said cathode layer.

[C025] 25. The fuel cell assembly according to claim 18, wherein said conducting layer comprises of a material selected from the group consisted of noble metals, metallic alloys, cermets, and oxides.

[C026] 26. The fuel cell assembly according to claim 18, wherein said conductive layer comprises a material selected from the group consisting of gold, silver, platinum, palladium, iridium, ruthenium, rhodium, indium-tin-oxide, ruthenium oxide, rhodium oxide, iridium oxide and indium oxide.

[C027] 27. The fuel cell assembly according to claim 18, wherein said fuel cell is selected from the group consisting of solid oxide fuel cells, direct methanol fuel cells, and protonic ceramic fuel cells.

[C028] 28. The fuel cell assembly according to claim 18, wherein said fuel cell comprises a solid oxide fuel cell.

[C029] 29. The fuel cell assembly according to claim 18 having one of a planar structure, a tubular structure and a combination thereof.

[C030] 30. A fuel cell assembly comprising a plurality of fuel cells, each of said fuel cells comprising

an anode layer, a cathode layer and an electrolyte interposed therebetween;

an anode interconnect to support said anode layer and a cathode interconnect to support said cathode layer; and

a conducting layer disposed on at least one of said cathode layer and said anode layer to reduce interface resistance between said anode layer and said anode interconnect and between said cathode layer and said cathode interconnect;

wherein at least one of said anode interconnect and said cathode interconnect is a hollow manifold comprising a top wall, a first side wall and a second side wall, said top wall, first side wall and second side wall defining a chamber therein, said top wall comprising at least one opening extending therethrough in flow communication with said chamber and said conducting layer is configured to facilitate transport of electrons from said anode layer and said cathode layer.